Structural Biology

PROTEOGLYCAN COMPOSITION WITHIN THE MENISCUS OF THE KNEE

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OBJECTIVE: *To investigate the medial and lateral portions of the menisci cartilage within the knee focusing on aggrecan composition and its components (proteoglycans and glycosaminoglycans).*

Proteoglycans (mucopolysaccharides) are relatively new 'specimens' to both the biology and chemistry fields. Structure, chemical composition, biological mechanisms, and nomenclature are just a few of the concepts beginning to be recognized in research labs across the scientific world. How these macromolecules aggregate together to form harmonious polymeric linkages is key to the functionality of various organs/systems all over the body. In our particular research involving a vast array of undergraduates, graduates, and doctors, twenty knee samples from the Royal Orthopedic Hospital/Royal Lancaster Infirmary were analyzed from healthy and injured individuals. The area of interest was that of the medial and lateral portions of the meniscus in the knee. This spongy cartilage was extracted and tested through various methods to see if the proteoglycan aggrecan (polymeric macromolecule) existed. Glycosaminoglycan (GAGs) composition was determined by the use of H-NMR. Goals of the research are continuing yet, developing more knowledge about this particular tissue. Long term goals of this project include finding a possible treatment and cure to osteoarthritis and other knee-related injuries.